PATENT ABSTRACTS OF JAPAN

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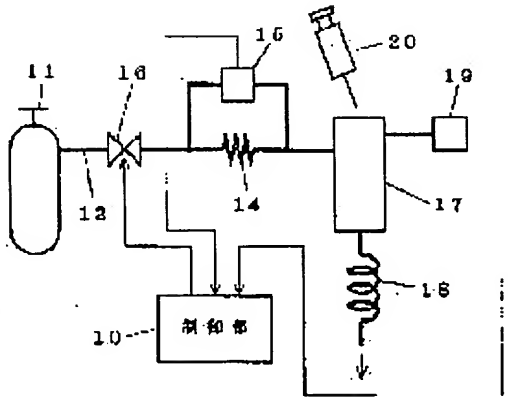
(54) GAS CHROMATOGRAPH

(57)Abstract:

PURPOSE: To reduce the cost of a gas chromatrograph by simplifying its structure.

CONSTITUTION: A pressure control valve is abolished, and a flow control valve 16 placed between a sample vaporizing chamber 17 and a differential pressure sensor 15 (flow resistance 14) is placed upstream the differential pressure sensor 15. A control portion 10 controls the flow rate F of a carrier gas using [F= K×(Pvp+ΔP)×(ΔP)n], Pvp being a value detected by the pressure sensor 19, ΔP a value detected by the differential pressure sensor 15, and K, (n) constants.



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* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to gas-chromatograph equipment.
[0002]
[Description of the Prior Art] Drawing 2 explains the configuration and actuation of the conventional gas chromatograph. The sample evaporation room 37 is established in the inlet port of the separation column 38, and the source 31 of carrier gas is connected to the sample evaporation room 37. The differential pressure sensor 35 which detects the differential pressure of the both ends of a pressure control valve 33, the passage resistance 34, and the passage resistance 34, and a flow control valve 36 are formed in the carrier gas passage 32 which connects the source 31 of carrier gas, and the sample evaporation room 37 sequentially from the upstream (source 31 side of carrier gas). The pressure sensor 39 for detecting the pressure of the inlet port of the separation column 38 is formed in the sample evaporation room 37 again.
[0003] In case a gas chromatograph is performed, the carrier gas of a predetermined flow rate is first supplied to the sample evaporation room 37 and the separation column 38. And if a sample is poured into the sample evaporation room 37 with transfer pipet 40, a sample is evaporated in the sample evaporation room 37, will be put on carrier gas, and will be sent out to the separation column 38, and segregation will be carried out there.
[0004] The flow rate F of the flowing carrier gas can express the carrier gas passage 32 with the following formula.
F=KxPinx(deltaP) n -- (1)
For Pin, in this formula, the pressure of the upstream (a points of drawing 2) of the passage resistance 34 and deltaP are [about 0.5 to one constant and K of the differential pressure of the both ends of the passage resistance 34 and n] proportionality coefficients.
[0005] Although the flow rate of carrier gas can be adjusted by closing motion of a flow control valve 36, in order to control the value F, it is necessary to fix Pin from the above-mentioned formula. Therefore, with conventional gas-chromatograph equipment, by forming a pressure control valve 33 in the upstream of the passage resistance 34, when Pin was fixed and a control section 30 adjusted the opening of a flow control valve 36 according to differential pressure deltaP of the both ends of the passage resistance 34 detected by the differential pressure sensor 35, control of flow was performed. In addition, when the pressure sensor 39 formed in the sample evaporation room 37 performed a chromatograph, it was used for the split ratio control at the time of performing setup of column appliance inlet pressure, or split analysis etc.
[0006]
[Problem(s) to be Solved by the Invention] With the above-mentioned conventional gas-chromatograph equipment, since the pressure control valve 33 for fixing Pin was required, while structure was complicated, there was a problem that cost was high.
[0007] The place which accomplishes this invention in order to solve such a technical problem, and is made into the purpose simplifies structure more, and is to offer the gas-chromatograph equipment which reduced cost.
[0008]
[Means for Solving the Problem] This invention accomplished in order to solve the above-mentioned technical problem In the gas-chromatograph equipment which supplies carrier gas to a sample evaporation room by the predetermined flow rate, evaporates this liquid sample by pouring a liquid sample into this sample evaporation room, and is sent out to a separation column a) The differential pressure sensor which detects the differential pressure of the passage resistance prepared in the pressure sensor which detects the pressure of a sample

evaporation room, and the carrier gas passage for supplying b carrier gas to a sample evaporation room, and the both ends of the passage resistance, c) It is characterized by having the flow control valve prepared in the carrier gas passage of the upstream rather than the above-mentioned passage resistance.

[0009]

[Function] Since the flow control valve is prepared in the upstream rather than passage resistance with the gas-chromatograph equipment concerning this invention, there is no element which produces a pressure drop between a sample evaporation room and passage resistance. Therefore, the pressure Pin of the upstream of the passage resistance used by the above-mentioned formula (1) is obtained by applying the differential pressure of the both ends of passage resistance to the pressure Pvp of a sample evaporation room. That is, a formula (1) is F=Kx(Pvp+deltaP) x(deltaP) n. -- (2)

It is expressed and the flow rate F of carrier gas passage can be computed only based on the output of a pressure sensor and a differential pressure sensor. Therefore, the flow rate F of carrier gas passage is controllable to arbitration by adjusting a flow control valve based on this calculation value.

[0010] In addition, what it has for the split ratio control at the time of performing setup of column appliance inlet pressure or split analysis in the above chromatograph equipment of the passage former etc. can be used for the pressure sensor which detects the pressure of a sample evaporation room as it is.

[0011]

[Effect of the Invention] With the gas-chromatograph equipment concerning this invention, since the pressure control valve which adjusts the pressure of carrier gas passage is unnecessary, while structure is simple and cost falls, the dependability of equipment improves.

[0012]

[Example] Drawing 1 explains the gas-chromatograph equipment which is one example of this invention. A pressure control valve 33 is abolished as compared with the conventional chromatograph equipment shown in drawing 2 , and the gas-chromatograph equipment of this example has the description at the place where the flow control valve 16 is arranged in the source 11 of carrier gas, and the carrier gas passage 12 between the passage resistance 14 (and differential pressure sensor 15). The pressure sensor 19 for being the same as that of conventional equipment about other parts, and the separation column 18 being connected to the sample evaporation room 17, and detecting the pressure (namely, inside of the sample evaporation room 17) of separation column 18 inlet port is formed.

[0013] In order to supply the carrier gas of a predetermined flow rate to the sample evaporation room 17 and the separation column 18, according to the above-mentioned formula (2), a flow control valve 16 is controlled by the gas-chromatograph equipment of this example. Namely, a control section 10 is based on differential pressure signal deltaP from the pressure signal Pvp from a pressure sensor 19, and the differential pressure sensor 15, and is F=Kx(Pvp+deltaP) x(deltaP) n. -- (2)

It computes, and the opening of a flow control valve 16 is adjusted so that this may serve as a predetermined value. In addition, a flow rate F may be controlled to become fixed and may be controlled to change in time. In this way, chromatographic analysis of a sample is performed by pouring a sample into the sample evaporation room 17 with transfer pipet 20 at the predetermined time, controlling the flow rate of carrier gas.

[0014] in addition, the gas-chromatograph equipment concerning this invention does not control the flow rate F of carrier gas, but is natural also to the case (in for example, the case of pressure control) which only carries out the monitor of the flow rate F -- it can use.

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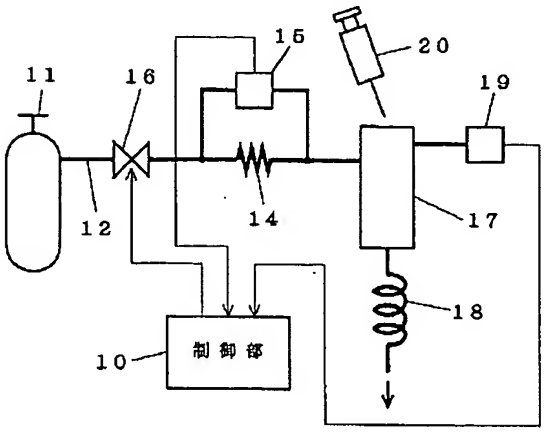
Drawing selection drawing 1



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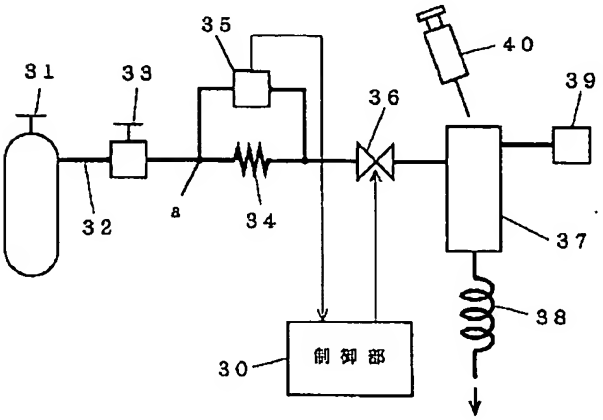

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